Amendments to the Claims

The following listing of the claims will replace all prior versions, and listings of the claims in the application:

Listing of Claims

1- 24 Canceled

25. (New) A communication system for communicating information over a power line grid comprising:

a first head-end unit connected at a distant end to the power line grid; and

one or more first hybrid units connected to the power line grid at a customer premises, said one or more hybrid units including:

a first client-end unit adapted to communicating with the first head end unit, and

a second head-end unit adapted to communicating with the first client-end unit and with one or more second client-end units.

26. (New) The communication system of claim 1, wherein one or more of the second client-end units also includes a third head-end unit, each third head-end unit being adapted to communicate with the one or more second client-end unit and one or more third client-end units.

27. (New) The communication system of claim 1, wherein each head-end unit communicates with one or more associated client-end units over: (1) a logical half-duplex downstream communication channel, whereby a carrier frequency of the head-end unit's transmitter output is matched by the receive frequency of each of the client-end units associated with the head-end unit, and (2) a logical half-duplex upstream communication channel, in which a carrier frequency of each of the client-end units' transmitter output is matched with the receive frequency of the head-end unit, the upstream and downstream channels associated with the head-end unit and the associated client-end units forming a sub-network.

28. (New) The communication system of claim 3 wherein the carrier frequencies of each of the downstream and upstream channels operating on the wide area power line network are mutually exclusive.

29. (New) The communication system of claim 4, wherein the system comprises a plurality of subnets, the frequency bands of the upstream and the downstream channels of the plurality of sub-networks being mutually exclusive.

30. (New) The communication system of claim 3, wherein the bandwidth of the downstream communication channel is substantially identical to the bandwidth of the upstream communication channel.

31. (New) The communication system of claim 3 wherein the upstream and the downstream channels each utilize a frame format comprising:

a flag field including a destination address,

a length field, which identifies the number of octets in the payload of the frame,

a media selector field, which identifies the type of payload,

a cyclic redundancy check (CRC) field, which contains the CRC value calculated over a remaining portion of the frame, and

a payload field including an arbitrary sequence of data.

32. (New) The communication system of claim 7, wherein each client-end unit examines the destination address of the data frame received from the head-unit, and (1) if the destination hardware address matches with its own hardware address, the frame is scheduled for processing, and (2) if the hardware address of the client-end unit is not found, the frame is discarded.

33. (New) The communication system of claim 3, wherein each upstream communication channel is divided into one or more time slots.

34. (New) The communication system of claim 9, wherein time slot resources in a head-end are allocated to the associated client-end units by a subscription based allocation scheme, wherein any unallocated resources are temporarily allocated to the associated client-end units with the constraints that the unallocated resources may be revoked at any time, without notice by the head-end unit.

35. (New) The communication system of claim 9, wherein every associated client-end device receives an equal share of the time slot resources.

36. (New) The communication system of claim 9, wherein time slot resources are dynamically reassigned when a new client-end unit is inserted into the network or a client-end unit which has been assigned time slot resources is deactivated.

37. (New) The communication system of claim 9, further including a medium access control sub-system within each head-end unit, the medium access control sub-system periodically broadcasting a time slot allocation signal in a predetermined one of the time slots, wherein if an individual one of the client-end unit detects the time slot allocation signal having an address of the individual client-end unit, the individual client-end unit may transmit in an allocated time slot, and if the individual one of the client-end units does not detect the allocated time slot signal with the address of the individual client-end unit, the individual client-end unit may not transmit in the allocated time slot.

38. (New) The communication system of claim 9, further including a medium access control sub-system within each head-end unit, the medium access control sub-system periodically providing a registration time slot adapted for receiving registration signals from the client-end units, wherein upon receipt of a registration signal from an individual one of the client-end units, the medium access control subsystem allocates a time slot to the individual client end-unit by including the address of the individual client-end unit in the next broadcasted time slot allocation signal.

39. (New) The communication system of claim 3, wherein the head-end unit

broadcasts identical downstream data to all client-end units on the same logical sub-network.

40. (New) A method of adding a client-end unit to the communication system of claim 1, comprising the steps of:

a. detecting a supervisory packet transmitted from a head-end unit;

b. searching the supervisory packet for an address of the client end unit;

c. storing a slot allocation in the client end unit if the address of the client end unit is found in the supervisory packet; and

d. sending a registration message to the head unit if the address of the client-end unit is not found in the supervisory packet, or within a subsequently transmitted supervisory packet within a predetermined time period, whereby upon receiving the registration message, the head-end unit adds the address of the client-end unit and a slot allocation for the client-end unit to a later transmitted supervisory packet.

41. (New) A method of detecting an inactive client-end unit on the communication system of claim 1, comprising the steps of:

a. examining each upstream time slot to determine if the transmission contains valid data;

b. incrementing a missing slot counter if the time slot does not contain valid data;

c. marking the client-end unit "down" if a maximum count in the missing slot counter is exceeded, removing the client-end unit's resource allocation record from a time slot allocation table broadcast by the head-end unit 1; and

d. allocating, if possible, the previously allocated time slots to other client-end units.

42. (New) A method of reconfiguring a client-end unit connected to the communication system of claim 1, comprising the steps of:

a. detecting a supervisory packet transmitted from a head-end unit;

b. searching the supervisory packet for an address of the client-end unit;

c. storing a slot allocation in the client-end unit if the address of the client-end unit is found in the supervisory packet; and

d. ceasing transmission if the client-end unit fails to find its address after detecting a predetermined number of supervisory packets.